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GENERAL ARTICLES

THORACIC NEURO-FIBROMA*

BY A. L. D'ABREU

From the Birmingham United Hospital

IN the last twelve months I have seen eight thoracic tumours that were of neuro-fibromatous character; all of these were causing symptoms, and seven of them were removed without post-operative complications. The eighth case was malignant and inoperable. No case was referred to me during the year as the result of mass radiography, and yet I believe a number of these tumours are being seen as the result of such surveys. The chief purpose of this short communication is to ask if all of these tumours should be removed whether symptom-free or not, and to enquire from the members present if the incidence of malignant transformation is high. The literature on this subject is perplexing in many respects, but chiefly with regard to the exact pathology and to the chances of malignant change; Brian Blades *et al.* (1944) reported 18 cases of proved intrathoracic nerve tumours at the Barnes Hospital of which 41 per cent. were malignant, an incidence that should indicate the necessity for operative removal whenever the diagnosis has been made.

THE PATHOLOGY AND SITE OF THE TUMOURS

The pathological appearances, both macroscopically and microscopically, of the tumours I have to report indicated without any doubt that fibrous tissue and nerve elements were present. Two of the tumours were ganglio-neuromata with sympathetic nerve cells present, and the remainder were identical with the appearances seen in Von Recklinghausen's neuro-fibromatosis; although I know and have seen that intra-thoracic neuro-fibromata occur in that disease none of the patients in this short series could be classified as such. Characteristically thoracic neuro-fibroma provides large ovoid tumours in the posterior mediastinum (Fig. 4), and four of the tumours were in this typical site; one a very large ganglio-neuroma lay in the anterior mediastinum

* A short communication to the Association for the Study of Diseases of the Chest, January 31, 1947.

(Fig. 3)—a very rare, perhaps unique, example of such a location—and the remaining two were situated in the lateral aspect of the chest wall, clearly seen at operation to be attached to the intercostal nerve.

In a short paper a full description of the characteristics of these fascinating tumours is not possible; none of these cases were complicated by intra-spinal prolongations; all were sub-pleural and all had a simple pedicle consisting mainly of a large branch of an intercostal artery. None had produced rib erosion; in fact one had caused sclerosis of the overlying rib (Fig. 7). Every tumour removed had areas of degeneration, often cystic, but with no histological evidence of malignant change, and all were surrounded by an easily stripped capsule.

THE CLINICAL FEATURES

An important aspect of this series is that all the tumours produced symptoms, though these were quite without pattern. Symptoms resulting from pressure and displacement of adjacent structures were dyspnoea which was gross in two patients, both with large tumours; partial atelectasis of a lobe of the lung in two; "asthma" in a child and severe pain in two from pressure on the associated intercostal nerve.

The most important diagnostic help is, of course, the radiograph, and in the seven tumours removed a correct pre-operative diagnosis was made in five: an erroneous pre-operative diagnosis of dermoid cyst was made in the case of a neuro-fibroma in the anterior mediastinum. The typical radiograph shows a clear outline to an ovoid dense shadow which has a flattened margin on the vertebral side when the tumour is in the posterior mediastinum (Figs. 4 and 6).

A Brief Account of the Patients

CASE 1.—A girl of 10. Ganglio-neuro-fibroma of the posterior mediastinum.

This child had an enormous tumour weighing 3 pounds (Fig. 2). She had been "chesty" for years and a diagnosis of asthma had been made. Dr. A. G. Watkins found her to be undersized, dyspnoeic and with gross displacement of the heart to the right side of the chest; dulness to percussion in the lower half of the left chest was the prominent clinical feature, and a radiograph provided a striking picture (Fig. 1). A large ovoid tumour, clearly arising from the posterior mediastinum in the lateral picture and displacing the heart and mediastinum to the right, had the characteristics of a large neurogenic tumour. At operation, performed through the bed of the resected seventh rib, the tumour was completely covered by pleura; it was readily removed, and its pedicle consisted of a large vessel arising from an intercostal artery close to the aorta.

The child is well a year after operation and has gained over a stone and a half in weight. It is difficult to explain this rapid improvement in physique except on the grounds of a general improvement in health secondary to the loss of a severe degree of dyspnoea.

The pathological appearances, microscopically and macroscopically, were those of a ganglio-neuroma with no evidence of malignancy. That these tumours are potentially malignant is the general opinion expressed in the literature.

PLATE IV.

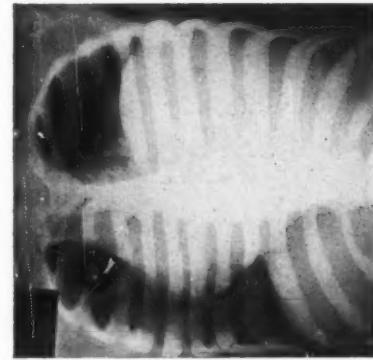


FIG. 1.—CASE 1. ANTERO-POSTERIOR
RADIOGRAPH SHOWING LARGE LEFT-
SIDED TUMOUR WITH GROSS DISPLA-
MENT OF THE HEART AND MEDIASTINUM
TO THE RIGHT. GANGLIO-NEUROMA.



FIG. 2.—CASE 1. CUT SURFACE OF
REMOVED TUMOUR.



FIG. 3.—CASE 2. GANGLIO-NEUROMA
REMOVED FROM ANTERIOR MEDIASTINUM.

[*To face p. 36.*

PLATE V.

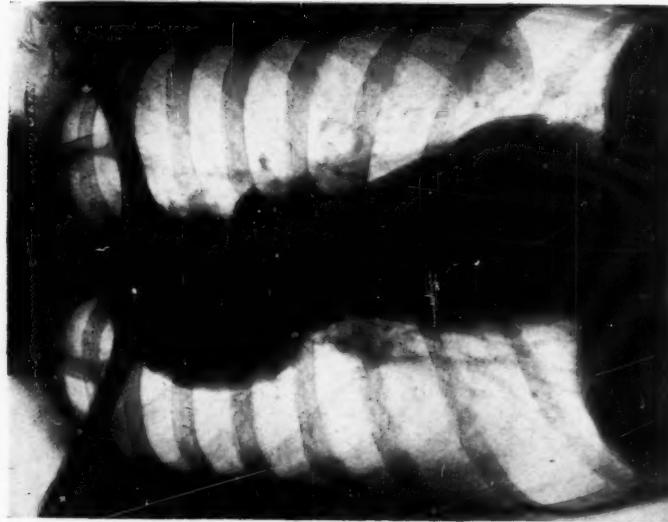


FIG. 4.—CASE 3. RADIOPHOTOGRAPH SHOWING TYPICAL POSTERIOR NEUROFIBROMA. SEVERE STRUDOR WAS PRESENT.



FIG. 5.—CASE 3. LATERAL RADIOPHOTOGRAPH OF LARGE POSTERIOR NEUROFIBROMA.

[To face p. 57.]

CASE 2.—Ganglio-neuro-fibroma of the anterior mediastinum.

I cannot find an account of this type of tumour arising in the anterior mediastinum. The patient was a soldier of 38 who developed pain in the left chest and pyrexia while in Germany. A diagnosis of pleurisy and pneumonia was altered to one of "aneurysm" after a chest radiograph had been taken early on in his illness, because of the presence of a large pulsating tumour apparently continuous with the heart. The Wassermann reaction was negative. When seen in this country the tumour on screening gave the impression of transmitted pulsation, and because of the site of the tumour a diagnosis of dermoid cyst of the mediastinum was made. At operation the tumour illustrated in Fig. 3 was removed through the classical lateral thoracotomy incision. The histology of the tumour was that of an innocent ganglio-neuroma. Recovery was uneventful.

CASE 3.—Posterior neuro-fibroma causing stridor from tracheal compression.

This patient, a woman of 43, had suffered from dyspnoea of steadily increasing extent for years. Shortly before her admission to hospital as an emergency because of severe tracheal obstruction she had developed a stridor of the sub-glottic type. There was considerable cyanosis and the veins of the neck were distended: there was clinical evidence of some emphysema. The radiographs of the chest (Figs. 4 and 5) showed a large ovoid tumour with a clear sharp right margin and emphysema of the right upper lobe. Although the diagnosis of retro-sternal goitre and of dermoid cyst were considered, the lateral radiograph shows the tumour to be situated posteriorly with an anterior prolongation. The diagnosis of intrathoracic goitre depends largely on an anterior location as shown on the lateral radiograph. The differentiation is clearly important as the goitres are removed from an anterior supra-sternal incision, whereas the neuro-fibroma is approached through a posterior thoracotomy incision.

In this patient a large tumour was removed from the posterior mediastinum after resection of the fourth rib beneath the scapula; a single large pedicle was present and the tumour was entirely sub-pleural. Both macroscopically and microscopically it was a typical simple neuro-fibroma.

She has made an uninterrupted recovery and has lost all dyspnoea.

CASE 4.—Posterior mediastinal neuro-fibroma. Recurrent attacks of "pneumonia."

R. C., aged 29, had suffered from several recurrent febrile illnesses associated with cough and sputum in the last four years. The diagnosis on each occasion was "pneumonia." He was referred to a tuberculosis clinic and the X-ray of his chest showed a large tumour (Fig. 6), with an area of patchy atelectasis lateral to it. At operation a portion of the right upper lobe was so adherent by chronic inflammatory tissue to the capsule of the tumour that a partial resection of the upper lobe was necessary. The histological examination of the tumour revealed no evidence of malignant change, and he has made a complete recovery.

CASE 5.—Mrs. P., aged 48.

This patient had symptoms of slight pain in the left chest, but complained chiefly of indigestion. In the preliminary examination radiologically of the chest, a tumour was seen in the left upper posterior mediastinum: it had all the radiological and histological characteristics of the tumours under discussion and was removed without incident.

It would be tempting to ascribe the gastric symptoms to pressure on the vagus, but I resist the entrance into realms of fancy.

CASES 6 AND 7.

These two patients had neuro-fibromata in the lateral chest wall and the chief symptom was "intercostal neuralgia."

CASE 6.—R. M. H., aged 56.

An ex-miner, with pneumoconiosis (see Fig. 7), who complained of severe pain in the region of the eighth right rib in the axillary line, where tenderness was present on palpation; the pain radiated to the front along the line of the eighth nerve. A radiograph, in addition to showing evidence of considerable pneumoconiosis, revealed an oval shadow 2 inches by 1 inch between the right eighth and ninth ribs; the lower border of the eighth rib showed osteo-sclerotic change.

Pre-operatively an exact diagnosis was not made, the issue being somewhat clouded by the patient's persistent reminder that he had a severe blow on the chest in the affected area a year before; this led us to think that the shadow might possibly be due to a small encysted extra-pleural collection of old blood. At operation, however, which involved resection of 3 inches of the eighth rib, an encapsulated tumour attached to the intercostal nerve was easily removed: he made a complete recovery with immediate loss of pain. The pathological examination of the tumour showed tissue of firm, whitish-yellow hyaline appearance with small cystic spaces. Microscopically the condition was a typical neuro-fibroma with no evidence of malignant transformation.

CASE 7.—Mrs. M. H., aged 29.

For two years she complained of a "neuralgic" pain chiefly felt at the front end of the third rib. In the absence of physical signs the condition was attributed to "neurosis" until a radiograph of the chest taken to exclude tuberculosis revealed a small circular tumour in the axillary line between the fourth and fifth ribs. Because of the experience gained in the last case, a diagnosis of neuro-fibroma was made. At operation through a right subscapular incision, the periosteum of the third rib was elevated and the tumour (Fig. 8) was seen to lie in the extrapleural tissue attached to the intercostal nerve; it was removed without entry into the pleura and recovery was complete. Histologically it was a neuro-fibroma.

Discussion

In a twelve-month period I have seen eight thoracic neuro-fibromatous tumours and have removed seven; all of these were causing symptoms such as pain, tracheal compression, "asthma," and "pneumonia." The differential diagnosis from cysts, dermoids, chondroma, retro-sternal goitre and such rare conditions as lipoma was usually not difficult, and the fact that all were causing symptoms made the decision to operate an easy one. The operative removal of all was fortunately easy because of the simple nature of the tumours and because all had a large solitary pedicle. This is not always the case in these tumours, the removal of which may be highly difficult if malignant transformation has taken place. One tumour was not operated on because a metastasis to the neck was subjected to biopsy and seen to be malignant. I believe that many of these tumours are being discovered by mass radiography throughout

PLATE VI.

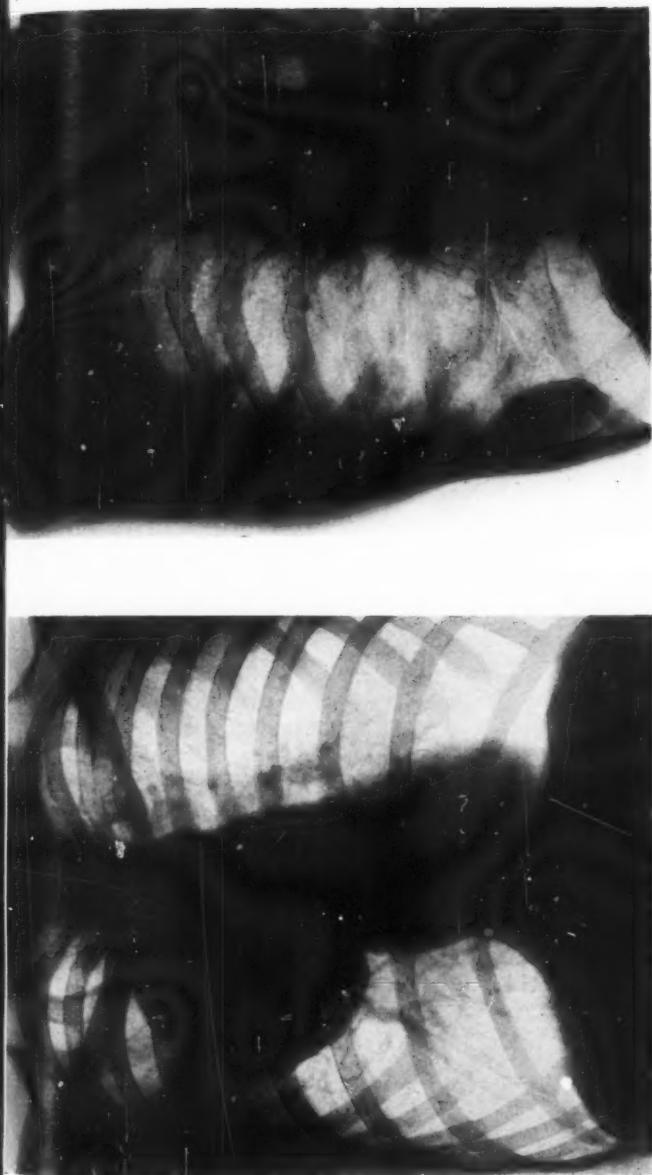


FIG. 6.—CASE 4. POSTERO-ANTERIOR RADIOPHOTOGRAPH SHOWING LARGE NEURO-FIBROMA. LATERAL AREA OF PARTIAL ATELECTASIS. RECURRENT ATTACKS OF "PNEUMONIA."

FIG. 7.—CASE 6. OBLIQUE VIEW OF RIGHT CHEST: OVOID TUMOUR IN REGION OF EIGHTH RIB WHICH SHOWS SCLEROSIS; RETICULATION IN LUNG THE RESULT OF PNEUMOCONIOSIS.

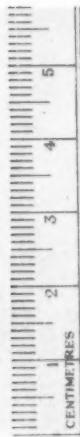


PLATE VII.



THE RIGHT ARM: PATCH TEST.

FIG. I.

THE LEFT ARM: MANTOUX TEXT.



To face p. 39.

the country. It would seem highly advisable to operate on these even if symptomless, and the danger of their removal should be slight if malignant change has not occurred. It seems unwise to allow the 41 per cent. malignant transformation rate recorded by Blades to develop.

NOTE.—Since the meeting at which this paper was read, I have seen two malignant neuro-fibromatous tumours.

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THE TUBERCULIN TEST: A COMPARISON OF THE PATCH TEST AND THE MANTOUX TEST IN WEST AFRICAN NATIVES

BY R. B. T. BALDWIN

From the Medical Research Institute, Yaba, Nigeria

THE object of this paper is to report the results obtained in a survey embracing 706 West African native school-children and a group of 69 contacts with known cases of pulmonary tuberculosis. Both the Mantoux and Patch tests were applied to each subject with a view to ascertaining if the Patch Test has a place in the investigation of the problem of tuberculosis in West Africa.

Methods

A method similar to that used by Court (1939) and Hart (1941) was adhered to throughout the survey. An area of skin about $4\frac{1}{2}$ by $1\frac{1}{2}$ in. was cleansed thoroughly of grease and dirt by vigorous rubbing with a pledget of cotton wool soaked in acetone, the assistant marking the upper and lower limits of the clean area by two grease pencil marks. The site selected was over the triceps muscle, the long axis being parallel to that of the arm. In order to obtain comparable results both arms were similarly treated, after which a "Vollmer" Patch test was applied to the right arm and a Mantoux test to the left arm, using a No. 26 needle and the "diagnostic" dose—i.e., $\frac{1}{10}$ mg. of Old Tuberculin (0.1 c.c. of a 1/1,000 dilution, Lederle, Dilution "C").

The subjects were then instructed not to interfere with the patch in any way and not to allow it to become wet for the next two days. After forty-eight hours the Mantoux tests were read and the patches were removed. At the same time, a note was made of the appearance of the Patch test, but readings were not taken as final until a lapse of a further forty-eight hours—i.e., a total of ninety-six hours after application.

Results

The positive Mantoux reactions were recorded as one, two, or three plus, although in the tables the results are given as positive or negative only. (One plus=a raised area 5-10 mm. in diameter, two plus=a raised area 10-15 mm.

in diameter, three plus—a raised area more than 15 mm. in diameter with or without vesiculation.) Little difficulty was experienced in reading the results of the Mantoux tests on black skins. One point, however, should be borne in mind. If on inspection no reaction could be seen, it was essential to palpate the skin around the site of inoculation, for it was frequently found that an area of induration sufficient to record a positive reaction was present, which would have been missed had inspection alone been relied upon. This, of course, is because the surrounding zone of erythema cannot be seen through the pigmented skin. In passing, it was noticed that a surprisingly large number of positives were three plus reactions. Often large brawny indurated swellings, three or four inches in diameter, were present, while "peau d'orange" was not infrequent. Vesiculation was common and actual necrosis and ulceration occurred in not a few cases. Presumably these severe reactions were due to the high degree of sensitisation so often found in relatively non-immune races.

The Patch tests were read ninety-six hours after application, having been removed forty-eight hours previously. A positive was recorded when a few papules to a raised indurated area were present in one or both of the two squares containing the Old Tuberculin (Hart, 1941). The middle square was a control soaked in saline. No attempt was made to grade the reactions to the Patch Test as in the Mantoux test, for it was clear almost from the beginning that the two tests frequently varied in intensity. Thus, a weakly positive Patch test was often accompanied by a three plus Mantoux test, while a one plus Mantoux test was often associated with a strongly positive Patch test.

Fig. 1 depicts a Patch test and a Mantoux test in the same subject, the intensity of the two reactions being roughly parallel. In both cases the black pigmentation of the skin completely masks the presence of the hyperæmic areola, which, judging from the surrounding induration which was palpable, must have been considerable. The two points of light seen on the bleb in the case of the Mantoux test are reflections of two electric lamps used to illuminate the arm.

Discussion

With respect to the interpretation of the Patch test, Court (1939) and Hart (1941) read their tests twenty-four hours after removal of the patch, but it was found in a preliminary trial on 100 school-children that the results were more clear cut after a forty-eight-hour interval, the extra twenty-four hours allowing the tuberculin reaction to become more pronounced and any reaction due to the effects of the adhesive to subside. Even so, however, it was not possible to make a reading of the Patch test in nineteen instances on account of the severity of the reaction to the plaster. It has already been pointed out that grading the results of the Patch test was not carried out because there were indications early in the survey that the Patch test had been tampered with either voluntarily or involuntarily.

The results of the tests on the school-children arranged in age groups are shown in Table I, at the foot of which are the results of the entire group of contacts. Table II gives a comparison between the numbers and percentages in which both tests were either positive or negative (complete agreement), and those in which this was not the case (complete disagreement).

TABLE I
Presents the numbers of positive and negative reactions and those in which the reactions were not in agreement.

Age Group in Years.	Both Tests Positive.		Both Tests Negative.		Patch Positive. Mantoux Negative.		Patch Negative. Mantoux Positive.		Reaction to Plaster Associated with: Mantoux +		Total Number of Subjects.
	No.	%	No.	%	No.	%	No.	%	No.	%	
6-9	24	38.1	31	49.2	3	4.8	3	4.8	0	2	63
10-14	124	49.0	94	37.1	9	3.5	15	6.0	4	7	253
15-19	248	64.3	138	28.2	1	0.0	93	6.0	3	3	365
Over 20	2	5.0	0	50.0	0	0.0	0	0.0	0	0	4
All groups	398	56.4	235	33.3	13	1.8	41	5.8	7	12	706
Contacts 11-70	53	76.8	10	14.5	0	0.0	6	8.7	0	0	69
Grand Total	..	..	..	..	..	..	..	..	..	..	775

TABLE II
Presents the number of times in the various age groups that the tests are in complete agreement or complete disagreement, and the total number positive to each test.

Age Group in Years.	Both Tests Positive or Neg- ative. (Complete Agreement.)		Tests in Complete Disagree- ment.		Total Number of Positive Patch Tests.		Total Number of Positive Mantoux Tests.		Difference in Total Positive Patch and Positive Mantoux Tests.		%
	No.	%	No.*	%	No.	%	No.	%	No.	%	
6-9	55	88.9	8	11.1	27	42.8	27	42.8	0	0.0	0.0
10-14	218	86.2	35	13.8	133	52.6	143	56.5	10	3.9	3.9
15-19	356	92.2	30	7.8	249	64.5	274	71.0	25	5.5	5.5
Over 20	4	100.0	0	0.0	2	50.0	2	50.0	0	0.0	0.0
All groups	623	89.6	73	10.4	411	58.2	446	63.2	35	5.0	5.0
Contacts 11-70	63	91.3	6	8.7	53	76.8	59	85.5	6	8.7	8.7
Grand Totals	696	89.8	79	10.2	464	59.9	505	65.2	41	5.3	5.3

* This column includes the 13 Patch+ Mantoux-, the 41 Patch - Mantoux+, and the 19 cases in which the Patch tests were obscured by the reaction to the plaster.

A total of 63 children from 6 to 9 years of age was tested. Of these 55 showed complete agreement between the tests. Among the 8 which disagreed, 3 gave positive Patch and negative Mantoux tests, 3 gave positive Mantoux and negative Patch tests, while in two cases, both of which were Mantoux negative, a reaction to the adhesive material in the plaster was so marked that it was impossible to make a reading of the Patch test. Among the 10-14 age group, of 253 children tested, 218 gave results in complete agreement, those of 35 disagreeing. Nine of these gave positive Patch and negative Mantoux, while no less than 15 failed to give a positive Patch test in the presence of a positive Mantoux test. In 11 children the reaction to the plaster made readings of the Patch test impossible, and of these 4 were positive to the Mantoux test. In the next age group, 15-19 years, 386 children were tested, and 356 gave results in complete agreement, and 30 results in complete disagreement. Only 1 of these gave a positive Patch with a negative Mantoux test, while 23 gave negative Patch with positive Mantoux tests. Six Patch tests were unreadable owing to severe plaster reactions, and of these 3 were Mantoux positive. The number of subjects over 20 years of age was too small to merit analysis. Among the 69 contacts of various ages with known cases of pulmonary tuberculosis, 63 gave results in complete agreement. The 6 which disagreed gave positive Mantoux tests and negative Patch tests.

In the entire group of 706 school-children, 41 (5.8 per cent.) gave positive Mantoux tests with negative Patch tests, and 6 contacts (8.7 per cent.) showed a similar discrepancy. This can largely be explained by such factors as inefficient cleansing of the skin, poor apposition of the patch to the skin, and removal or interference with the patch, or allowing it to become wet, so that some, or all, of the Old Tuberculin in the patches was washed out. A further reason may be that the higher the age the less likely is the Patch test to give a positive result in a Mantoux positive person, the highest incidence of such cases being 8.7 per cent. among the contacts, of whom about half were adults.

The group with positive Patch and negative Mantoux readings, however, is more difficult to explain. Only 13 of the school-children (1.8 per cent.) showed this discrepancy. Had such cases been subjected to a further Mantoux test using 0.1 c.c. of 1/100 Old Tuberculin, it is quite possible that some at least of the reactions may have become positive. Thus Hart (1938) found in his series that the disagreements between the Mantoux and Patch tests were *all* positive when retested with 1/100 Old Tuberculin. Unfortunately this procedure was not carried out in this series.

From the individual standpoint and in the case of small surveys, in comparing the results of the two tests attention should be confined to the figures for complete agreement and disagreement. Although these varied in the different age groups, in the 775 school-children and contacts, there was complete disagreement in 79 cases, no less than 10.2 per cent. On the other hand, when the difference between the totals of Patch positive and Mantoux positive cases is examined, there is a difference of 41, or only 5.3 per cent., roughly half the complete disagreement as computed above. (See bold figures in Table II.) In the footnote to Table II it is pointed out that the 10.2 per cent. figure for "complete disagreement" includes 19 cases in which the Patch test was obscured by a severe reaction to the plaster. Although it seems unjustifiable

to regard these cases as being in complete disagreement with the Mantoux test, from the standpoint of actually recording a result, which after all is one of the objects of performing any test, this figure has been adhered to throughout the discussion and summary. Analysis of these 19 cases is shown in column six of Table I. Omitting the age groups 6-9 and those over 20, but including the contacts, it will be noticed that in every age group the total number of Mantoux positives exceeds the total number of Patch positives. Court (1939), however, in an examination of 110 cases, obtained complete agreement between the two tests. On the other hand, other observers found the opposite. Thus Pearce and others (1940) in America found 7 per cent. more positive Patch tests than positive Mantoux tests, though it is true that they used Purified Protein Derivative instead of Old Tuberculin, thus eliminating possible reactions due to impurities in the latter. In the case of the entire group of school-children and contacts under discussion, then, the difference between the totals of Patch positive and Mantoux positive tests was only 5.3 per cent., and if what is required is a knowledge of the degree of tuberculinization of a population, the Patch test will supply this information, though the figure obtained will be rather less than that which would be arrived at using the Mantoux test. In large-scale surveys, a greater accuracy could be obtained by following up the Patch negative reactors, and those with severe plaster reactions with a Mantoux test, first at 1/1,000 dilution, followed if necessary by 1/100 dilution.

In view of the discrepancies observed in the present series, the Patch test is too unreliable to be used in small surveys and in the investigation of individual cases, and the Mantoux test should be used, a dilution of 1/10,000 Old Tuberculin being employed in the first instance in order to avoid the frequent severe reactions consequent on using the usual diagnostic dose of 1/1,000 Old Tuberculin.

Summary and Conclusions

706 West African native school-children and 69 contacts with known cases of pulmonary tuberculosis were subjected to both the Mantoux and the Patch test; 59.9 per cent. were positive to the Patch test, and 65.2 per cent. were positive to the Mantoux test, a difference of 5.3 per cent. Complete disagreement, however, was found in 79 cases (10.2 per cent.). This figure includes 19 cases in which the result of the Patch test was obscured by a severe plaster reaction.

Although in all cases the Mantoux test is the one of choice, the Patch test will give a fairly good idea of the degree of tuberculinization of a population if the negative reactors are subsequently subjected to a Mantoux test. The Patch test is not recommended for use in small surveys and in individual cases, when investigation should be commenced by 1/10,000 Old Tuberculin in order to avoid severe reactions.

My thanks are due to Dr. J. W. P. Harkness, Director of Medical Services, Nigeria, for permission to publish this paper, to Col. D. H. Mills (late R.A.M.C.) and to Dr. R. G. Hahn of the Rockefeller Foundation for their advice and criticism, and to the Health and Education authorities of Lagos for their co-operation.

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AN UNUSUAL CASE OF ACTINOMYCOSIS OF THE LUNG AND THYROID

By L. M. SHORVON AND RUTH PEARSON

From Mount Vernon Hospital.

THE patient, S.T.W., a colonel, aged 50, began to feel unwell early in 1946 while stationed in India. In May he began to have pain in the right shoulder and down the inner aspect of the right arm together with some cough and expectoration. He was admitted to hospital and X-ray showed a rather dense opacity occupying the upper zone of the right lung together with slight displacement of the trachea to the right. The sputum was A.F.B. negative, but one gastric residue was A.F.B. positive. He was losing weight and running a slight temperature. A diagnosis of pulmonary tuberculosis was made and he was evacuated to the United Kingdom and admitted to the Connaught Hospital on 14.8.46, where he was kept on bed rest under observation. The X-ray of the chest remained largely unchanged, although perhaps a little denser with the trachea rather more drawn to the right. Repeated sputum tests were negative on direct and concentration examinations and culture failed to yield any evidence of A.F.B. although he was coughing up a considerable amount of muco-purulent sputum and, on occasions, had small haemoptyses. His general condition slowly deteriorated. The pain in the right shoulder was very troublesome. He was pyrexial, but his haemoglobin was 90 per cent. and there was no leucocytosis. A diagnosis of carcinoma of the bronchus was suggested as an alternative to the original diagnosis of pulmonary tuberculosis, and the patient was transferred to a non-tuberculosis bed in Midhurst Sanatorium for investigation to determine the nature of the opacity in the right lung. Bronchoscopy on 18.9.46 showed a normal bronchial tree and a bronchogram showed complete filling of the right lung bronchi with no evidence of any block or bronchiectasis. X-ray of the spine was normal. He was seen by an eminent thoracic surgeon, who considered that bronchial carcinoma was an unlikely diagnosis. It was thought that he might have a chronic pyogenic infection behind the opaque mass in the right upper zone and he was given one million units of penicillin spread over six days with no appreciable effect. He returned to the Connaught Hospital, where his condition continued to deteriorate. He remained febrile (up to 100° F.), lost weight, and the pain increased in severity. He was re-admitted to Midhurst on 12.11.46 for another bronchoscopy, which again showed no evidence of disease in the bronchi. After discussion it was decided that a diagnosis of endothelioma of the pleura was indicated and it was recommended that he should be treated by deep X-ray therapy as soon as possible.

He was admitted to Mount Vernon Hospital under the care of Professor Windeyer on 4.12.46. He complained of persistent pain in the right shoulder and had an irritating cough. His general condition was poor. He looked pale and was dyspnoeic on slight exertion. Examination of the chest revealed signs of consolidation of the right upper lobe. X-ray of the chest showed no change in the dense opacity in the right upper zone. Blood examination showed a

hypochromic anaemia, haemoglobin 42 per cent.; white blood cells 14,000 per c.mm. (polymorph neutrophils, 77 per cent.; lymphocytes, 14 per cent.; large mononuclears 9 per cent.). His W.R. was negative. He commenced a course of deep X-ray therapy on 10.12.46 which was completed on 21.1.47. (The factors employed were kV 190, mA 6, filter of 0.5 mm. Cu, and focus-skin distance 40 cm. Three fields were $7\frac{1}{2}$ by 15 cm., two fields 10 by 8 cm. and one field 10 by 15 cm. Five skin fields received 3,000 r and the remaining skin field 2,200 r in 34 treatments given over a period of 42 days and the estimated minimum dose to the lesion was 5,510 r). During the treatment his haemoglobin fell to 32 per cent. and he was on two occasions transfused with 2 pints of blood. His E.S.R. on 3.3.47 was 88 mm./hr. Westergren. He was seen by a consulting physician on 7.3.47, who reported that there appeared to be an extensive infiltration of the upper lobe of the right lung. Posteriorly, between the upper part of the scapula and the spinal column there was bronchial breathing so intense as to be almost tubular, friction sounds were audible in the right axilla and coarse rales at the base of the right lung. His impression was that the solid lung was the result of an infiltrating growth which could possibly have originated in the pleura. The patient gradually got weaker, with no alleviation of the pain, and died on 25.4.47.

Necropsy

External appearances.—Body of a middle-aged very pale man. There were no sinuses communicating with the deep tissues. There was oedema of both legs, scrotum, right side of neck, right axilla and right arm. Pupils were equally dilated.

Superficial tissues.—There was excess fibrous tissue throughout the tissues covering the right side of the thorax.

Respiratory System.—The right pleural cavity was obliterated at the apex and at the base there was much clear straw-coloured fluid. There was some clear straw-coloured fluid present on the left side. The right upper and middle lobes were very firmly adherent to the chest wall and eroded the clavicle and bodies of the upper three thoracic vertebrae. There was extension under the clavicle of the pathological process involving the lung. The subclavian vessels and roots of the brachial plexus were affected. The right upper and middle lobes on sectioning were composed of a finely nodular yellowish-white tissue. Thick green pus oozed from numerous small foci, but no yellow granules were seen. The lower lobe was consolidated. The left lung showed a large area of basal consolidation and at the apex there was a small area of cavitation surrounded by yellowish-white tissue exuding green pus exactly like the other side.

The mediastinal glands were slightly enlarged, soft and dark. There was no evidence of extension to them of the process affecting the right upper and middle lobes.

Thyroid gland.—There was moderate general enlargement of both lobes of the thyroid, the right more than the left. Green pus welled from them on sectioning. Very little thyroid tissue remained, almost all of both lobes being replaced by the same yellowish-white nodular tissue as was present in the lungs. There was no direct extension of disease process between the lungs and the thyroid.

Remaining Organs.—No gross abnormality of the other organs found beyond cloudy swelling of the kidneys and liver and moderate enlargement of the spleen with perisplenitis. The myocardium was extremely pale.

Histology

Lungs.—The right upper and middle lobes are entirely destroyed and replaced by granulation tissue. The left apex shows a small area of granulation surrounded by normal lung. The right lower lobe shows confluent bronchopneumonia. No fungus present.

Thyroid.—Both lobes are replaced by granulation tissue, the right lobe showing complete destruction of normal tissue, the left lobe showing some residual colloid containing acini (Fig. 1).

The Granulation Tissue.—The granulations from the right and left lungs and the right and left lobes of the thyroid present the same histological appearances. There are multiple clumps of fungus having a faintly purple staining centre and a very brilliant eosin-staining peripheral layer of radiating club-shaped processes. The clumps are surrounded by a thick layer of polymorphs, mainly neutrophils, with a few eosinophils. Outside the polymorphs there is a layer of fibroblasts and fat-laden histiocytes. The layers of polymorphs and histiocytes surrounding each clump tend to merge into each other depending on the closeness of the clumps to each other. There is a generalised surrounding increase in fibrous tissue. No endarteritis of the vessels seen. The appearance of the fungus and the surrounding granulation tissue (Fig. 2) follows almost exactly the description given by Professor Newcombe in Cope's (1938) excellent monograph.

Discussion

Actinomycosis in order of frequency affects the following sites: (1) cervico-facial region, (2) abdomen, (3) thorax, (4) other sites. The incidence of the condition in the thorax may be shown by the figures of civilian deaths furnished by the Registrar-General. Those for the years 1940-5 are shown in the following table and include lung, pleura and lung in association with other sites:

Year.	Deaths.
1940	.. .. 16
1941	.. .. 26
1942	.. .. 14
1943	.. .. 14
1944	.. .. 11
1945	.. .. 6

Primary thoracic actinomycosis may arise by inhalation of minute particles of infected material or occasionally by aspiration of a large portion of infected material such as a carious tooth, as in the cases reported by Israel (1878) and Warwick (1923). The condition may also develop as a result of fungus penetrating the oesophageal wall and reaching the mediastinum. Secondary thoracic actinomycosis may be the result of spread from above or below or may come by the bloodstream from elsewhere.

Actinomycosis of the thyroid is extremely rare. Cope searched the literature and found only 8 cases described. Three of these were cases of pyæmia; Shapiro (1931), Fellinger and Salzer (1932), Koehler's (1884) early case;

PLATE VIII.

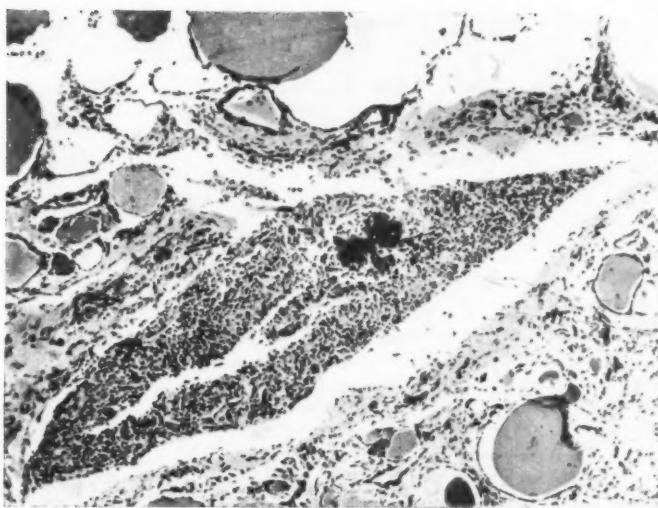


FIG. 1.—L.P. ($\times 86$). SHOWING GRANULATION TISSUE CONTAINING A CLUMP OF FUNGUS, SURROUNDED BY COLLOID CONTAINING THYROID ACINI.

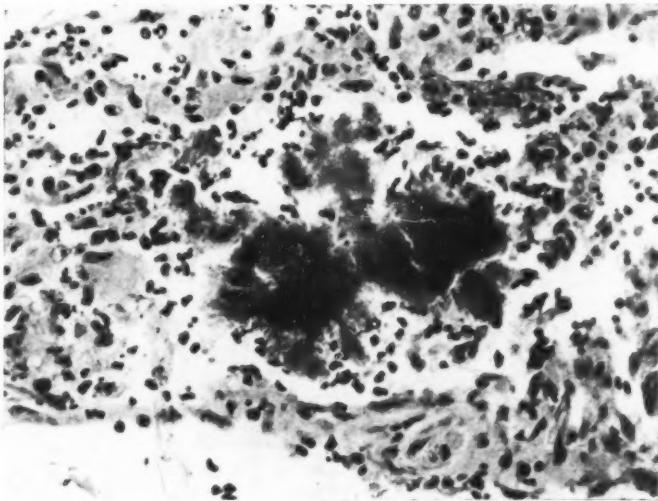


FIG. 2.—H.P. ($\times 350$). SHOWING THE CLUMP OF FUNGUS WITH ITS RADIATING CLUB-SHAPED PROCESSES, SURROUNDED MAINLY BY POLYMORPHS, BUT HISTIOCYTES AND FIBROBLASTS AS WELL.

[To face p. 66.

whilst the abscess which Mulhaupt (1888) recorded as having been found in the left lobe of the thyroid occurred as a metastasis. Of the 4 cases which were purely local affections the infection occurred through the skin in Gardiner's (1934-5) case, from the pharynx in Sommeyre's (1927) case; whilst in the remaining two, McQuay's (1931) and Koehler's (1894) later case, there was no definite guide as to the route of infection.

In this case the method of infection is undetermined. There was no facio-maxillary or gastro-intestinal lesion. Although the route of pulmonary infection may have been by inhalation there is no real evidence to show whether the infection in the lung came before that in the thyroid, except that in spite of the long duration of the illness and the almost complete destruction of normal thyroid tissue the patient showed no characteristic clinical evidence of myxoedema.

There are several other points of interest. Actinomycosis of the lungs is usually basal and this was an apical lesion. The case had a history of at least 15 months and yet no sinuses were found in the chest wall, which is almost unique. Also there was an effusion at the base but composed of clear straw-coloured fluid. Such clear effusions are only described very early in the disease and later become turbid and frequently point. Enlargement of the spleen is frequently noted, and Cope says that this is due to amyloid disease. In this case at post-mortem the spleen weighed 13 oz. and was therefore moderately enlarged, and must have been bigger as at one time it had been palpable clinically. There was no evidence of amyloid disease, and histologically the spleen was found to be packed with haemosiderin due to the excessive breakdown of red cells by the infective process.

As seen from the above description of the case the clinical diagnosis of thoracic actinomycosis may be exceedingly difficult or impossible. Diagnosis cannot be made with certainty unless the fungus is found in the sputum or in the discharge from an empyema or abscess of the chest wall. Among the conditions which have to be differentially diagnosed are pulmonary tuberculosis, carcinoma of the bronchus, pulmonary abscess and bronchiectasis.

For treatment many remedies have been advocated, and it is our belief that in such a fatal condition as pulmonary actinomycosis one should not rely on any one form of treatment but should use all the means at our disposal. This procedure was successful in a severe case of actinomycosis of the liver, another fatal condition, recently treated at this E.M.S. Radiotherapy Centre, using potassium iodide, sulphonamides, massive doses of penicillin, vaccine, blood transfusions together with surgical drainage and the local application of thymol and penicillin to the sinuses. Although penicillin is often efficacious the *in vitro* penicillin-sensitivity of the organism varies greatly, and MacGregor (1945) stresses that a sensitivity test *in vitro* is essential before any prognosis for penicillin treatment can be given. Certainly in some cases very heavy dosage is required. Deep X-ray therapy is valuable in actinomycosis, but the dose we employ is much less than was given to this patient, who was thought to be suffering from a neoplasm. In spite of the large amount of radiation he received, histologically, apart from some increase in fibrosis, the fungus appeared unaffected. This is due to the fact that X-ray cure of actinomycosis, when obtained, is by indirect action.

We wish to thank Professor B. W. Windeyer for permission to publish this case.

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HÆMATOGENOUSLY DISSEMINATED PULMONARY TUBERCULOSIS

BY R. GRENVILLE-MATHERS

From Pendyffryn Hall Sanatorium

RADIOLOGY now plays a dominant role in the diagnosis and treatment of pulmonary tuberculosis. So far pathology has failed to give any definite answer to the riddle of pathogenesis and evolution in adult tuberculosis. Skiagrams, too, can be most fallacious, for conclusions drawn from them may be completely wrong. The following cases are presented with these reservations in mind.

Out of 385 admissions to Pendyffryn Hall Sanatorium there were 33 cases whose skiagrams showed lesions which seemed to fall into a definite group. All had fine individual lesions, alike in size and appearance, widely disseminated in the lungs. In 16 of them, the individual opacities became more poorly defined as time went by and softening with the formation of cavitation developed in some areas (Fig. 1). The remaining cases showed foci which were more sharply defined and connected together by fine strands (Fig. 2). In this group the disease did not progress and the radiological appearances on discharge were little changed from those on admission. In 30 cases both lungs were involved; in 17 all zones were affected, in 4 both upper and middle zones and in 9 both upper zones. In the 3 unilateral cases the right upper zone alone was the site of disease. Enlarged hilar glands were present in all cases except three, two of whom had extra-pulmonary foci.

The clinical features were not distinctive. The presenting symptom in all cases was either malaise or loss of weight. Cough, with or without sputum, appeared later. Search for extra-pulmonary foci revealed tuberculosis of the kidney and larynx in one case and affection of the kidney and one metacarpo-phalangeal joint in another. The average age of the 33 cases was 39 years. There were 4 deaths.

The development of cavitation was not associated with any change in expectoration. Possibly the cavities were formed by the necrotic material

PLATE IX.

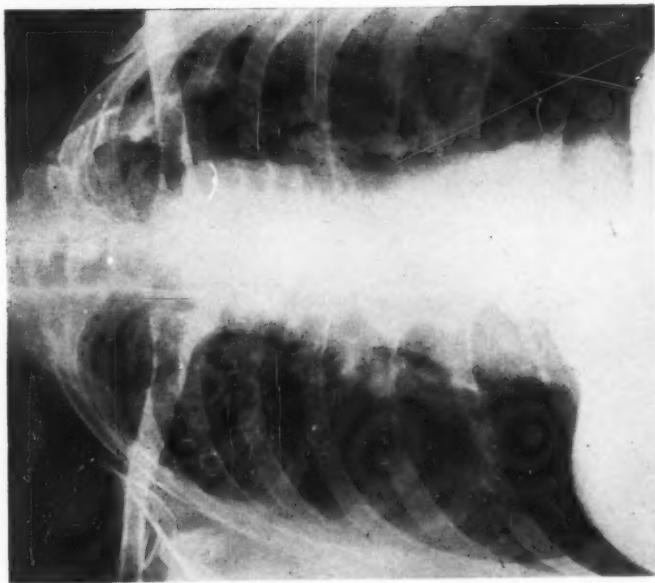


FIG. 1.—SHOWING SUPERIMPOSED CAVITATION.

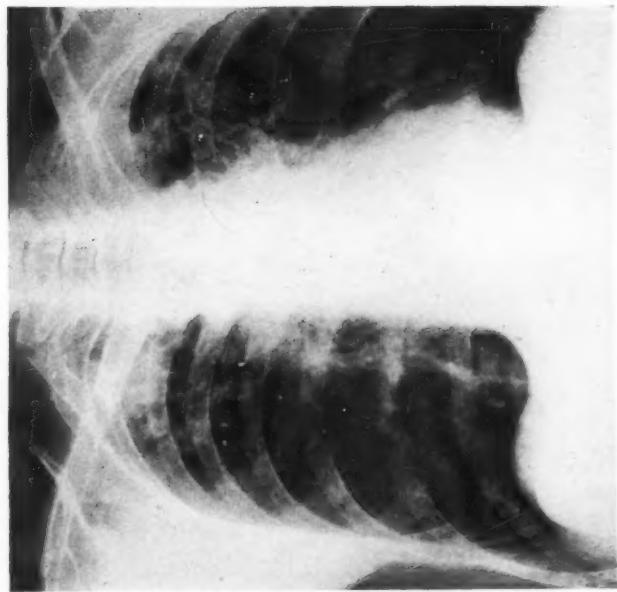


FIG. 2.—SHOWING SHARPLY DEFINED FOCI CONNECTED BY FINE STRANDS.

[*See face p. 63.*

PLATE X.

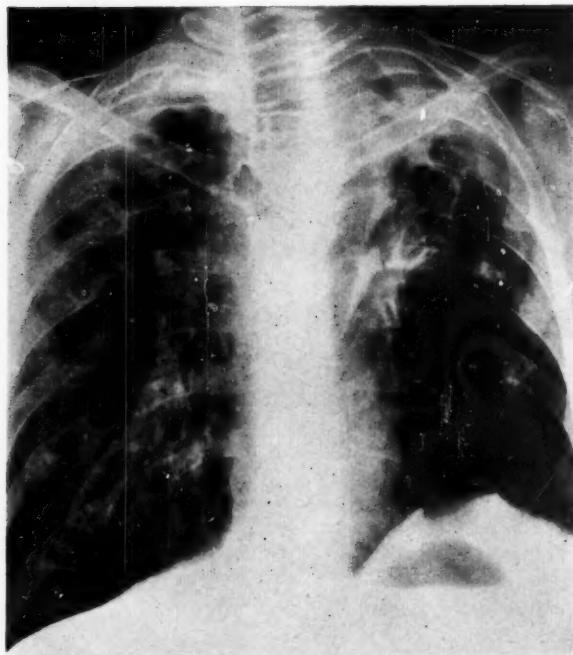


FIG. 3.—CHRONIC DISEASE WITH SUPERIMPOSED MILIARY SPREAD.

being absorbed, the absence of fibrosis causing rapid distension. Spontaneous disappearance of a cavity was seen in one case.

All the cases had the distinctive radiological appearances throughout the area of the lesion and not just confined to one part. The number where this was present at the start may well have been higher. In 13 of the cases it is known that the lesions became coarser and cavitation developed; the radiological appearances then bore no relation to the previous state of affairs but showed the typical appearance of bronchogenic phthisis. Many of the others admitted as bronchogenic phthisis could very well have started like the group here described.

Among the same 385 admissions there were 10 cases in which a similar fine, widely disseminated lesion was superimposed on fibro-caseous disease. This occurred suddenly in patients with a long history of disease, the average duration being 4 years. The disease was, by all appearances, quiescent before this change occurred, and the general condition was usually good. All these patients died, the time between this new radiological appearance and death averaging three and a half months. Figure 3 is the radiograph of such a patient, who had an 11-year history of disease and survived for 4 months after this new lesion appeared. Shortly before death a rib abscess developed and also renal tuberculosis.

Discussion

The conception of three stages in the evolution of tuberculosis, advocated by Ranke (1916), is accepted as a basis for the explanation of the various manifestations of the disease. The second stage of haemato-genously disseminated disease has been regarded as a mode of origin of adult type phthisis; but this view has been largely abortive up to now because cases followed sufficiently to show the development have been reported only rarely.

The first group of cases described here could be examples of haemato-genously disseminated disease. Such a dissemination is believed to occur concurrently or immediately after development of a primary focus so that the average age of 39 years in this series seems to be an objection to this view. Yet Heimbeck (1928a, b) in Norway and Daniels (1944) in this country have shown that there is, at the present time, an appreciable part of the adult population who do not react to tuberculin. Either these people have never been infected or have healed one infection and so can react as if the previous infection had never occurred (Terplan, 1940). Such a dissemination as this is also more likely to be seen in older people when the lymphatic barrier is diminishing. The lymphatic tissue of the body increases rapidly between the ages of 6 and 8 to reach its maximum between 10 and 12. It returns at 20 years to its size at 7 years and there is then a steady decrease from 20 to old age. In young people this lymphatic barrier probably only allows a few foci, such as those described by Simon, to be formed unless it is overcome by a swamping generalised miliary spread. In the cases described here, some reaction of the lymphatic barrier occurred, as shown by the glandular enlargement found, but this could not apparently prevent further dissemination of the disease.

Since no extra-pulmonary focus was found in 31 of the 33 cases any

dissemination which occurred must have been mainly from the hilar glands into the thoracic duct and from there to the right heart and the lungs, though dissemination via the general circulation cannot be rigorously excluded since clinically latent foci of disseminated disease are known to occur in tuberculosis.

Another explanation of these cases is that the development of the lesions is by direct insidious growth of the initial lung lesion into adult phthisis. But against this view is the very extensive nature of the lesions when first detected. Numerous small foci have been reported in primary infections but they have all been in close proximity to the primary focus or at least in the same lobe as the main focus (Gohn, 1916). Such primary foci are also usually in the lower lobes. Haematogenous dissemination as a stage in the development of adult phthisis would also explain the presence of extensive bilateral disease in some symptomless cases when the diagnosis is first made.

The second group is believed to show a terminal miliary spread due to the eruption of a caseous lesion into one of the pulmonary vessels. Extra-pulmonary lesions were not detected in 9 cases, probably because the patient did not live long enough for them to develop. The development of this change, however, did allow the immediate exposition of a hopeless prognosis which would not have been warranted in bronchogenic cases.

Summary

Thirty-three cases of pulmonary tuberculosis are described. Reasons are given for believing that they arose by haematogenous dissemination from foci in the hilar glands. Ten cases of fibro-caseous disease with a terminal miliary dissemination are also reported.

I wish to thank Dr. J. Reginald Beal, Senior Tuberculosis Officer, Northumberland C.C., for his interest, advice and criticism.

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SCROTAL PNEUMOCELE AS A TRANSIENT COMPLICATION OF ARTIFICIAL PNEUMOPERITONEUM

BY W. N. ROGERS AND J. V. GARRETT
From the Military Wing of Baguley E.M.S. Hospital

PNEUMOPERITONEUM has become established as a useful method of treatment in selected cases of pulmonary tuberculosis, in association with rest and other therapeutic measures. As Simmonds (1946) remarks, sufficient experience has been accumulating to start assessing its value and complications. Scrotal

pneumocele appears to be a rare complication; only three cases have been recorded and none in the British literature.

This report deals with a case which came under our observation and presents features which are of interest in deciding the course to be taken when such complication is met with.

Case Record

S. A. W., a sergeant, aged 21, was admitted to hospital in the Middle East in October 1946, complaining of malaise, lassitude and productive cough of two and a half months' duration. Pulmonary tuberculosis was diagnosed on the evidence of a positive sputum and the radiological appearance of the lungs, which showed extensive bilateral infiltration. His general condition was very poor, and whilst in hospital further extension of the disease occurred in the left lung. Secondary anaemia was present, and on two occasions a blood transfusion was started but had to be abandoned owing to rigors. Following these transfusions the urine was found to contain epithelial and granular casts and a few red cells.

On November 25 a left artificial pneumothorax was induced but had to be abandoned owing to extensive adhesions. He was evacuated to England in January 1947, when he first came under our care.

At the age of 6 he had pneumonia. The family history was negative for tuberculosis. His occupation both before and since enlistment was a clerk.

On examination he was seen to be a pale, delicate, toxic, red-haired youth, complaining of cough and sputum. His weight was eight stone, more than one stone below normal. Bronchial breathing and scattered crepitations were heard over both upper and mid-zones. No other abnormal clinical signs were found. Skiagram of the chest showed an elongated thorax with low diaphragm. Both the heart and mediastinum were displaced to the left. Confluent infiltration and probable cavitation in left upper and mid-zones; extensive acino-nodular infiltration in the right upper and mid-zones. Emphysema and moderate scattered infiltration in both lower zones. The pulse was 80-90; the temperature 97°-99° F.; respirations 22. The sputum contained tubercle bacilli. His blood sedimentation was $\frac{12}{100}$ mm. Wintrobe and $\frac{10}{100}$ when corrected for the anaemia. (R.B.C. 4,400,000, Hb 86 per cent.) The urine contained a trace of albumen, casts and red cells, but no tubercle bacilli.

For a fortnight he was made to lie flat in bed, being fed and washed. After four more weeks of strict bed rest his general condition had improved and he had gained $4\frac{1}{2}$ pounds in weight. It was then decided to induce a pneumoperitoneum. On February 26 a small trocar and canula were introduced, according to our usual routine, following local anaesthesia, just lateral to the border of the left rectus muscle above the transumbilical line, and 700 c.c. of air were given. During the induction the patient complained of indefinite pain in the lower abdomen. An hour later a more definite pain was felt in the left groin which gradually became worse and spread downwards into the scrotum. The scrotum gradually became swollen and about five hours after the induction was rather larger than a man's fist, and remained so for a few days. On examination it was found that the swelling had occurred in the left scrotal sac. The skin was tense, the rugæ obliterated and the raphe displaced to the right. On palpation the scrotum was tender and appeared to be under tension, the left testicle could be felt at the bottom of the sac. The inguinal region was also tender and swollen. There was no trace of surgical emphysema and apart from the pain no constitutional disturbance. The pain decreased

very much in twenty-four hours and the swelling subsided in the course of the next nine days.

The swelling was clearly due to air which had escaped from the peritoneal cavity into the scrotum, and in view of this it was at first decided to postpone giving refills. By the time the swelling had subsided the paper by Monto and Bradford (1943) had come to our notice and it was decided to give a further refill using, if necessary, a pressure pad on the inguinal ring as described by these authors.

Accordingly, on March 7, 600 c.c. of air were given. There was no recurrence of the swelling and the pad was not used. On March 10 and 14 refills of 850 c.c. were given followed by weekly refills of 1,000 c.c. from March 18 with no recurrence of the pneumocele. An intra-abdominal pressure of plus 10 cm. of water was noted. A skiagram was taken on March 18 and showed elevation of the diaphragm to the level of the 5th rib on each side.

Discussion

Scrotal pneumocele as a complication of pneumoperitoneum treatment was apparently first mentioned by Besta (1934), quoted by Banyai (1946), who gives a very short account of this case and describes one of his own. Banyai's patient had had a pneumoperitoneum established for seven months when he suddenly developed a left scrotal pneumocele. This disappeared in four days, but no mention is made as to whether the refills were continued.

Monto and Bradford (1943) record a case of left scrotal pneumocele occurring at the second refill in one of their patients. By placing a pressure pad on the inguinal ring these authors tried to prevent the recurrence of this complication. Subsequently they found that the pad could be dispensed with.

The explanation of the mechanism by which scrotal pneumocele occurs must be sought in the embryological development of the affected area. In late foetal life a diverticulum of peritoneum, the processus vaginalis, projects from the abdominal wall into the scrotum, forming the inguinal canal as it does so.

Later the testes migrate from their intra-abdominal position into the scrotum, passing along the posterior wall of the processus vaginalis and invaginating its lower part. In early infancy the connection between the peritoneal and scrotal sacs normally becomes obliterated and the scrotal portion forms the tunica vaginalis.

Various abnormalities, however, occur. The processus vaginalis may remain patent throughout its length, or there may be only a thin membrane separating the two cavities. It is usually held that the obliteration of the processus vaginalis is more often defective on the right side, but scrotal pneumocele so far appears to be more common on the left side.

In two of the previous cases the pneumocele occurred after pneumoperitoneum had already been established. In our case it occurred at induction, but was accompanied by pain and the swelling developed gradually. We are inclined to think therefore that no open passage existed originally and that the air forced apart the walls of the processus vaginalis which were weakly adherent. The rapidity with which the communications closed is further evidence in favour of its traumatic opening. In Monto and Bradford's case the closure may have been assisted by the pressure pad, but in ours it occurred spontan-

ously, suggesting that the traumatised tissue had healed. These authors think that the irritant effect of the air may have caused the final closure, but there appears to be little evidence that, even after prolonged pneumoperitoneum treatment, adhesions tend to form.

The interest in this case lies partly in its rarity, but mainly in showing that this complication is not necessarily a contra-indication to continuing this form of treatment.

Summary

A case of scrotal pneumocele after induction of pneumoperitoneum is reported. The treatment was continued without recurrence after the pneumocele had reabsorbed spontaneously. The mechanism of production is discussed and it is suggested that a traumatic opening of an anomalous processus vaginalis occurs.

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REVIEWS OF BOOKS

American Sanatorium Association. National Tuberculosis Association, New York, 1947. No price given.

This historical sketch covers the life of the American Sanatorium Association from its foundation in 1905 to its absorption into the American Trudeau Society in 1938. It gives a record of every meeting held by the society, and a few personal notes about the elections and retirements of members. There is little to be gained from reading a list of the titles of papers, and this publication can be of limited interest to those outside the Association. It has its place, however, as an historical document, and is a useful reminder of how little the subjects for discussion have changed in forty years.

J. V. S.

Empire and Colonial Tuberculosis: A General Survey. By Professor S. Lyle Cummins. Pp. 56. National Association for the Prevention of Tuberculosis, London, 1947. Price 5s.

The introduction of tuberculosis among primitive races and previously uninfected communities results in disease which differs in many ways from that seen in European countries. In this survey Professor Lyle Cummins gives an account of the present situation in various parts of the Empire, and includes some of the American experience among Negro and Indian communities. A description is given of the service available in some parts of Africa, and of the work done under the auspices of the N.A.P.T. in Cyprus, Burma, and the West Indies.

It is not possible in a booklet of this size to do more than present the facts, and a detailed analysis of their implications must be left to individual papers. The many interesting observations include the recording of a significant correlation between the intensity of tuberculin reaction and subsequent breakdown rate; the development by natives mining in the Rand of a more florid

type of disease than that seen in those remaining in their villages; and the demonstration of an acid-fast bacillus which may be found in the sputum of tuberculin-positive or negative patients and which is neither pathogenic to guinea-pigs nor culturable.

This is a fascinating and scholarly survey. It tells of the zeal and devotion of many who have worked under the most difficult circumstances. It will stimulate interest in all that can be added to our knowledge of tuberculosis by the study of its evolution in unaccustomed soil.

J. V. S.

Report of the Ministry of Health for the Year Ended March 31, 1946, including the Report of the Chief Medical Officer on the State of the Public Health for the year ended December 31, 1945. London: H.M. Stationery Office. Price 3s. 6d. net.

From the point of view of those interested in chest disease, the most useful part of the Report of the Chief Medical Officer is that which deals with tuberculosis. It is pointed out that the trend of tuberculosis death rates during the war is not informative because of the complicated effect of selective recruitment on these rates. The best measure of the mortality trend in these years is the actual number of deaths, including those of non-civilians, since the bulk of these occurred in England and Wales, and the aggregate of the population at risk was not changing much. The total number of deaths from respiratory tuberculosis in England and Wales for 1945 was 20,013, compared with 23,660 in the peak year of 1940 and 23,633 in 1941.

Notification of cases of respiratory tuberculosis showed a steady increase during the war years up to 1944. This increase, at any rate in the later years, was ascribed to the new cases found on mass radiography, but in 1945 the number of notifications fell to approximately the 1943 figure.

A table showing the state of institutional accommodation disclosed that in England and Wales the waiting list for such accommodation on December 31, 1945, was 5,382. The number of beds empty at that time, but not available because of lack of nursing and domestic staff, was 3,461. This means that if these beds could have been made available roughly two-thirds of the waiting list would have been provided with institutional care. It is very properly emphasised in the report that this lack of institutional accommodation should not be regarded as a reason for refraining from case finding. There still remains much that can be done, both for the patient in his home and for his contacts.

The number of persons examined up to the end of 1945 by the Mass Radiography Units was 797,000. Between 3 and 4 per thousand of this total had previously unsuspected pulmonary tuberculosis. There were also roughly 1,000 cases of other pulmonary conditions which were detected and placed under medical care. It is interesting to note that while approximately 200 intrathoracic new growths were discovered, only 70 of these proved to be malignant.

H. N.